

## **Appendix 5**

### **Invertebrate Survey**

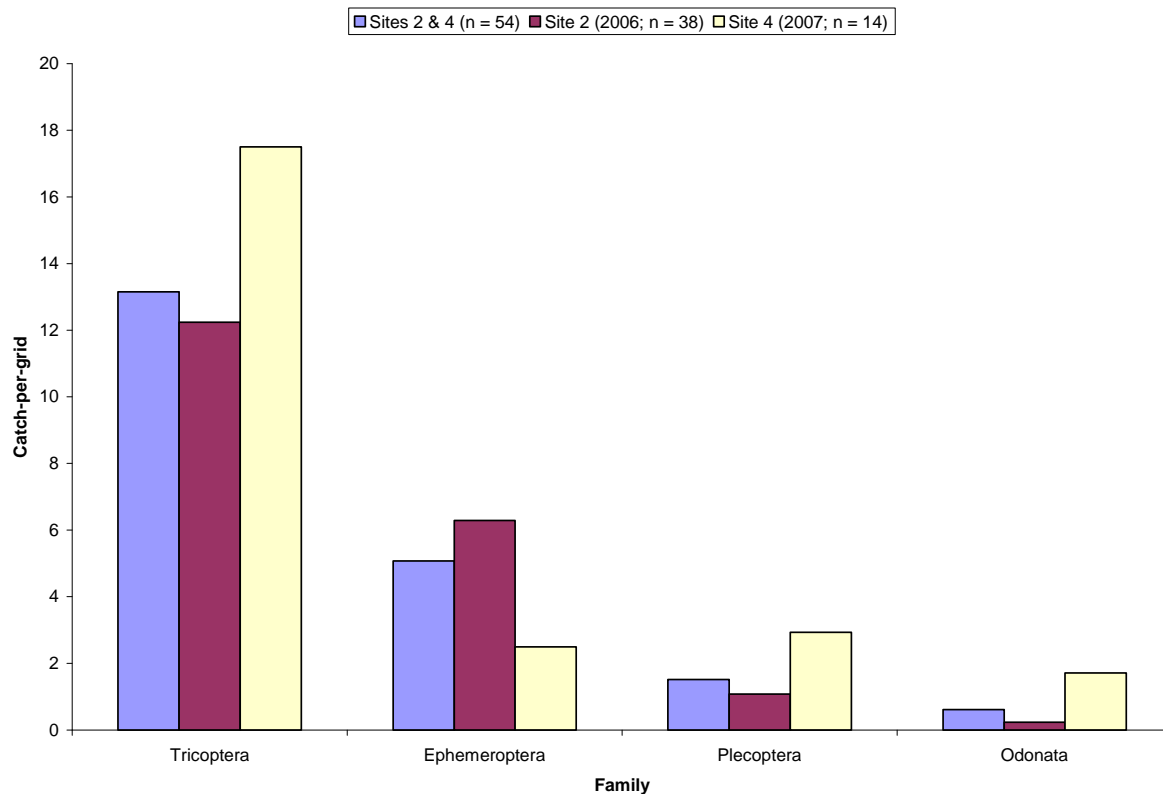
## **Invertebrate survey sampling methods**

Invertebrate surveys were conducted in September of 2006 and November of 2007 within the Lamprey Designated River. The surveys were conducted using 1x1 meter quadrates placed at seven random locations within specific HMU types. The placement was determined by visually dividing the HMU into square units and using previously generated random numbers to locate the seven positions within each HMU where quadrates were to be placed. Upon placement of each quadrate an invertebrate sample was collected from within each quadrate using a “clean and sweep” method of a 1-meter wide swath down the center of each quadrate. Invertebrate samples were collected using a submerged drift net. A sweep of the center of each quadrate (1meter wide) was conducted by disturbing, or cleaning the sediments located between the top (upstream) and bottom (downstream) end of each quadrate. Samples were collected within the drift net, which was placed at the downstream center of the quadrate. Samples were labeled for site location, HMU type, and grid number, and stored in ethynol for later identification in the laboratory. Using this method, 38 quadrates were surveyed from multiple HMU types within Site 2, just downstream of Wadley Falls, in 2006. Similarly, in 2007, 14 additional quadrates were surveyed from multiple HMU types within Site 4, just downstream of Lee Hook Road.

In 2006 a total of 239 Ephemeroptera, 41 Plecoptera, 465 Trichoptera, and 9 Odonates were sampled from 38 grids placed within multiple hydromorphologic unit types throughout the upper portion of Site 2 below Wadley Falls. The average number of individuals from each family caught per grid within Representative Site 2 was 6.3, 1.1, 12.2, and 0.2, respectively (Figure 9).

In 2007 a total of 35 Ephemeroptera, 41 Plecoptera, 245 Trichoptera, and 24 Odonates were sampled from 14 grids placed within multiple hydromorphologic unit types throughout the upper portion of Site 4 below Lee Hook Road. The average number of individuals from each family caught per grid within Site 4 was 2.5, 2.9, 17.5, and 1.7, respectively (Figure 9).

Of the 33 individual odonates collected from the 68 grids within the Lamprey Designated River during 2006 and 2007, there were 7 different species observed: spine-crowned clubtail (21), shadow darner (4), Illinois River cruiser (3), common spreadwing (2), blue-fronted dancer (1), black-tipped darner (1), and lancet clubtail (1). All 9 odonates collected from the 38 grids sampled within Site 2 were collected from different grids. In other words, only 9 grids within Site 2 contained an odonate and none contained more than one individual. Within Site 4, the 24 individual odonates collected were sampled from 7 different grids. Among the grids containing odonates, Site 4 had a higher density of odonates per grid (3.4) than Site 2 (1).



**Figure 1. Lamprey Designated River benthic macro-invertebrate catch-per-grid.**

### Invertebrate survey data

#### Site 2 (28-29, September 2006)

#### EPT Taxa:

River	Date	Site #	HMU #	HMU Type	Grid #	E	P	T	Totals:
Lamprey River	9/28/2006	2	20201	Pool	1	2	0	0	2
Lamprey River	9/28/2006	2	20201	Pool	2	0	0	3	3
Lamprey River	9/28/2006	2	20201	Pool	3	0	1	0	1
Lamprey River	9/28/2006	2	20201	Pool	4	0	0	0	0

Lamprey River	9/28/2006	2	20201	Pool	5	1	0	0	1
Lamprey River	9/28/2006	2	20201	Pool	6	4	0	1	5
Lamprey River	9/28/2006	2	20201	Pool	7	3	0	3	6
Lamprey River	9/28/2006	2	20202	Ruffle	8	33	6	81	120
Lamprey River	9/28/2006	2	20202	Ruffle	9	10	6	47	63
Lamprey River	9/28/2006	2	20202	Ruffle	10	9	3	6	18
Lamprey River	9/28/2006	2	20202	Ruffle	11	72	6	87	165
Lamprey River	9/28/2006	2	20202	Ruffle	12	5	0	20	25
Lamprey River	9/28/2006	2	20202	Ruffle	13	7	0	23	30
Lamprey River	9/28/2006	2	20202	Ruffle	14	12	5	7	24
Lamprey River	9/28/2006	2	20203	Riffle	15	6	3	13	22
Lamprey River	9/28/2006	2	20203	Riffle	16	5	2	25	32
Lamprey River	9/28/2006	2	20203	Riffle	17	1	2	10	13
Lamprey River	9/28/2006	2	20203	Riffle	18	4	2	18	24
Lamprey River	9/28/2006	2	20203	Riffle	19	21	1	24	46
Lamprey River	9/28/2006	2	20203	Riffle	20	6	1	21	28
Lamprey River	9/29/2006	2	20203	Riffle	21	4	0	15	19
Lamprey River	9/29/2006	2	20214	Pool	22	0	1	2	3
Lamprey River	9/29/2006	2	20214	Pool	23	3	0	1	4
Lamprey River	9/29/2006	2	20214	Pool	24	0	0	0	0
Lamprey River	9/29/2006	2	20214	Pool	25	2	0	0	2
Lamprey River	9/29/2006	2	20214	Pool	26	0	0	0	0
Lamprey River	9/29/2006	2	20214	Pool	27	2	0	0	2
Lamprey River	9/29/2006	2	20214	Pool	28	0	1	2	3
Lamprey River	9/29/2006	2	20210	Sidearm	29	1	0	0	1
Lamprey River	9/29/2006	2	20210	Sidearm	30	3	0	4	7
Lamprey River	9/29/2006	2	20210	Sidearm	31	No	Sample	Collect ed	

Lamprey River	9/29/2006	2	20210	Sidearm	32	0	0	0	<b>0</b>
Lamprey River	9/29/2006	2	20210	Sidearm	33	1	0	1	<b>2</b>
Lamprey River	9/29/2006	2	20210	Sidearm	34	2	0	0	<b>2</b>
Lamprey River	9/29/2006	2	20210	Sidearm	35	1	0	2	<b>3</b>
Lamprey River	9/29/2006	2	20216	Run	36	8	0	25	<b>33</b>
Lamprey River	9/29/2006	2	20216	Run	37	0	0	0	<b>0</b>
Lamprey River	9/29/2006	2	20216	Run	38	9	1	9	<b>19</b>
Lamprey River	9/29/2006	2	20216	Run	39	2	0	15	<b>17</b>
Lamprey River	9/29/2006	2	20216	Run	40	No	Sample	Collect ed	
Lamprey River	9/29/2006	2	20216	Run	41	No	Sample	Collect ed	
Lamprey River	9/29/2006	2	20216	Run	42	No	Sample	Collect ed	
<b>Totals:</b>						<b>239</b>	<b>41</b>	<b>465</b>	<b>745</b>

**Odonata:**

<b>River</b>	<b>Date</b>	<b>Site #</b>	<b>HMU #</b>	<b>HMU Type</b>	<b>Grid #</b>	<b>Presence</b>	<b>Common Name</b>	<b>Scientific name</b>
Lamprey River	9/28/2006	2	20201	Pool	1	Odonate	Spine-crowned Clubtail	<i>(Hylo) Gomphus abbreviatus</i>
Lamprey River	9/28/2006	2	20201	Pool	2	No Odonates		
Lamprey River	9/28/2006	2	20201	Pool	3	No Odonates		
Lamprey River	9/28/2006	2	20201	Pool	4	Odonate	Illinois River Cruiser	<i>Macromia illinoensis</i>
Lamprey River	9/28/2006	2	20201	Pool	5	No Odonates		
Lamprey River	9/28/2006	2	20201	Pool	6	No Odonates		
Lamprey River	9/28/2006	2	20201	Pool	7	No Odonates		
Lamprey River	9/28/2006	2	20202	Ruffle	8	No Odonates		
Lamprey River	9/28/2006	2	20202	Ruffle	9	No Odonates		
Lamprey River	9/28/2006	2	20202	Ruffle	10	Odonate	Shadow Darner	<i>Aeschna umbrosa</i>
Lamprey River	9/28/2006	2	20202	Ruffle	11	Odonate	Illinois River Cruiser	<i>Macromia illinoensis</i>
Lamprey River	9/28/2006	2	20202	Ruffle	12	No Odonates		

Lamprey River	9/28/2006	2	20202	Ruffle	13	No Odonates		
Lamprey River	9/28/2006	2	20202	Ruffle	14	No Odonates		
Lamprey River	9/28/2006	2	20203	Riffle	15	Odonate	Blue-Fronted Dancer	<i>Argia apicales</i>
Lamprey River	9/28/2006	2	20203	Riffle	16	No Odonates		
Lamprey River	9/28/2006	2	20203	Riffle	17	No Odonates		
Lamprey River	9/28/2006	2	20203	Riffle	18	No Odonates		
Lamprey River	9/28/2006	2	20203	Riffle	19	No Odonates		
Lamprey River	9/28/2006	2	20203	Riffle	20	No Odonates		
Lamprey River	9/29/2006	2	20203	Riffle	21	Odonate	Shadow Darner	<i>Aeschna umbrosa</i>
Lamprey River	9/29/2006	2	20214	Pool	22	No Odonates		
Lamprey River	9/29/2006	2	20214	Pool	23	No Odonates		
Lamprey River	9/29/2006	2	20214	Pool	24	No Odonates		
Lamprey River	9/29/2006	2	20214	Pool	25	No Odonates		
Lamprey River	9/29/2006	2	20214	Pool	26	No Odonates		
Lamprey River	9/29/2006	2	20214	Pool	27	No Odonates		
Lamprey River	9/29/2006	2	20214	Pool	28	No Odonates		
Lamprey River	9/29/2006	2	20210	Sidearm	29	No Odonates		
Lamprey River	9/29/2006	2	20210	Sidearm	30	Odonate	Shadow Darner	<i>Aeschna umbrosa</i>
Lamprey River	9/29/2006	2	20210	Sidearm	31	N/A	No sample collected	
Lamprey River	9/29/2006	2	20210	Sidearm	32	No Odonates		
Lamprey River	9/29/2006	2	20210	Sidearm	33	No Odonates		
Lamprey River	9/29/2006	2	20210	Sidearm	34	No Odonates		
Lamprey River	9/29/2006	2	20210	Sidearm	35	Odonate	Illinois River Cruiser	<i>Macromia illinoiensis</i>
Lamprey River	9/29/2006	2	20216	Run	36	No Odonates		
Lamprey River	9/29/2006	2	20216	Run	37	Odonate	Shadow Darner	<i>Aeschna umbrosa</i>
Lamprey River	9/29/2006	2	20216	Run	38	No Odonates		
Lamprey River	9/29/2006	2	20216	Run	39	No Odonates		

Lamprey River	9/29/2006	2	20216	Run	40	N/A	No sample collected	
Lamprey River	9/29/2006	2	20216	Run	41	N/A	No sample collected	
Lamprey River	9/29/2006	2	20216	Run	42	N/A	No sample collected	

**Site 4 (01, November 2007)**

**EPT Taxa:**

River	Date	Site #	HMU #	HMU Type	Grid #	E	P	T	Totals:
Lamprey River	11/1/2007	4	40501	Rapids	43	4	1	1	6
Lamprey River	11/1/2007	4	40501	Rapids	44	3	1	26	30
Lamprey River	11/1/2007	4	40501	Rapids	45	3	4	7	14
Lamprey River	11/1/2007	4	40501	Rapids	46	5	10	16	31
Lamprey River	11/1/2007	4	40501	Rapids	47	5	6	42	53
Lamprey River	11/1/2007	4	40501	Rapids	48	3	1	23	27
Lamprey River	11/1/2007	4	40501	Rapids	49	2	4	18	24
Lamprey River	11/1/2007	4	40503	Glide	50	1	4	27	32
Lamprey River	11/1/2007	4	40503	Glide	51	1	0	31	32
Lamprey River	11/1/2007	4	40503	Glide	52	2	0	7	9
Lamprey River	11/1/2007	4	40503	Glide	53	1	2	5	8
Lamprey River	11/1/2007	4	40503	Glide	54	1	1	12	14
Lamprey River	11/1/2007	4	40503	Glide	55	2	7	25	34
Lamprey River	11/1/2007	4	40503	Glide	56	2	0	5	7
<b>Totals:</b>						<b>35</b>	<b>41</b>	<b>245</b>	<b>321</b>

**Odonata:**

<b>River</b>	<b>Date</b>	<b>Site #</b>	<b>HMU #</b>	<b>HMU Type</b>	<b>Grid #</b>	<b>Presence</b>	<b>Common Name</b>	<b>Scientific name</b>
Lamprey River	11/1/2007	4	40501	Rapids	43	No Odonates		
Lamprey River	11/1/2007	4	40501	Rapids	44	No Odonates		
Lamprey River	11/1/2007	4	40501	Rapids	45	Odonate	Black-tipped Darner	<i>Aeschna tuberculifera</i>
Lamprey River	11/1/2007	4	40501	Rapids	46	No Odonates		
Lamprey River	11/1/2007	4	40501	Rapids	47	No Odonates		
Lamprey River	11/1/2007	4	40501	Rapids	48	No Odonates		
Lamprey River	11/1/2007	4	40501	Rapids	49	No Odonates		
Lamprey River	11/1/2007	4	40503	Glide	50	Odonate	Lancet Clubtail	<i>Gomphus exilis</i>
Lamprey River	11/1/2007	4	40503	Glide	50	Odonate	Common Spreadwing	<i>Lestes disjunctis</i>
Lamprey River	11/1/2007	4	40503	Glide	50	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	50	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	50	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	50	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	50	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	50	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	51	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	51	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	51	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	51	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	52	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey	11/1/2007	4	40503	Glide	52	Odonate	Spine-	(Hylo)



River							crowned Clubtail	<i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	52	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	52	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	53	Odonate	Common Spreadwing	<i>Lestes disjunctis</i>
Lamprey River	11/1/2007	4	40503	Glide	54	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	54	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	54	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	54	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	55	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	55	Odonate	Spine-crowned Clubtail	(Hylo) <i>Gomphus abbreviatus</i>
Lamprey River	11/1/2007	4	40503	Glide	56	No Odonates		